IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants	:	Shahram Mihan et al.
Application Number	:	10/588,390
Filed	:	August 4, 2006
Title	:	PREPARATION OF SUPPORTS FOR CATALYSTS
Group Art Unit	:	1793
Examiner	:	Colette B. Nguyen
Docket No.	:	LU 6161 (US)

Mail Stop: Appeal Brief—Patents
Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest is Basell Polyolefine GmbH.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, their representatives, or their assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 20-42 are canceled. Claims 1-19 are rejected and are thus on appeal.

IV. STATUS OF AMENDMENTS

Claims 1-19 were amended and claims 20-42 were canceled during prosecution. All claim amendments had been considered and entered by the Examiner. No further claim amendments are made in this Appeal Brief.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' claim 1 claims a process for preparing a support for catalysts. The process comprises preparing a hydrogel (Specification, from page 3, line 34 to page 5, line 11); milling the hydrogel to give a finely particulate hydrogel having a solids content (Specification, page 5, lines 13 to 24); producing a slurry having a solids content, the slurry comprising the finely particulate hydrogel (Specification, page 10, lines 11 to 16); and drying the slurry comprising the finely particulate hydrogel, thereby forming a support for catalysts (Specification, from page 13, line 37, to page 14, line 28). The finely particulate hydrogel comprises at least 5% by volume of the particles, based on the total volume of the particles that have a particle size in the range from > 0 µm to ≤ 3 µm; and at least 40% by volume of the particles, based on the total volume of the particles that have a particle size in the range from > 0 µm to ≤ 12 µm, and at least 75% by volume of the particles, based on the total volume of the particles that have a particle size in the range from > 0 µm to ≤ 35 µm. (Specification, from page 6, line 11, to page 9, line 13.) Claims 2-14 depend from claim 1. Claim 15 claims a support made according to the process described above. Claims 16 and 17 depend from claim 15. Finally, claim 18 claims a process for supporting a catalyst on the support prepared accordingly.

VI. GROUNDS OF REJECTIONS TO BE REVIEWED ON APPEAL

Anticipation rejection of claims 1-19 under 35 USC § 102(b) by *Denton et al.* (U.S. Pat. No. 6,329,315).

VII. ARGUMENTS

A. Applicable Law

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). According to MPEP § 2131.02, "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989.)

B. Novelty of Claims 1-19

Claims 1-19 are not anticipated by *Denton et al.* because at least two essential claim elements are missing from the reference.

According to the Examiner, *Denton et al.*'s teaching encompasses the process steps of the claims. As discussed in section V of this Brief, one important aspect of Appellants' invention is milling the hydrogel (see claim 1(b)). Hydrogels are water-containing gels of inorganic hydroxides. See Specification, page 3, line 38. The water content of the hydrogels which can be prepared according to Appellants' invention is preferably at least 80% by weight, more preferably at least 90% by weight of the total weight of the hydrogel. See Specification, page 4, lines 4-6. After the hydrogel has been milled into a finely particulate hydrogel, it is then converted to slurry (see claim 1(c)).

On the contrary, *Denton et al.*'s process does not involve milling a hydrogel. Instead, it teaches dry milling inorganic oxide to form powder. See step (A) of *Denton et al.*, col. 6, lines 34-39. Note that inorganic oxides differ from inorganic hydroxide in that oxides must react with water to form hydroxides. The above underlined terms "dry," "oxide," and "powder" clearly indicate that *Denton et al.*'s milling step (A) involves essentially no water. In contrast,

Appellants' milling step (b) is to mill a hydrogel which is a hydroxide in at least 80% water based on the total weight of the hydrogel.

The Examiner asserted that *Denton et al.* teaches silica gel process with either dry milling or optionally wet milling. See page 2, item 3 of the Final Office Action of 02/03/2009. Appellants respectfully note that the Examiner read the reference incorrectly. *Denton et al.*'s step (B) involves "optionally, wet milling an aqueous slurry." See *Denton et al.*, col. 6, line 41. According to *Denton et al.*, the powder from dry milling of step (A) can be converted to slurry and the slurry can optionally milled in its step (B). Since the inorganic oxide has been dry-milled to fine powder in its step (A), milling the slurry in step (B) is optional for *Denton et al.* Again, according to Appellants' invention, the hydrogel is milled to finely particulate and the finely particulate hydrogel is then converted slurry. It is clear that *Denton et al.* does not teach milling a hydrogel as defined in Appellants' claims (see, e.g., claim 1(b)).

Second, the particle sizes defined in Appellants' claims refer to the sizes of the hydrogels (see, e.g., the wherein clause of claim 1), while the particle sizes taught by *Denton et al.* refer to the sizes of dry gels. Hydrogels are water-containing gels which contains at least 40% water, preferably at least 80% water, and more preferably 90% water. See Specification, page 3, lines 28-35. In contrast, *Denton et al.* defines the particle sizes of the gels after they were spray-dried. See *Denton et al.*, col. 9, line 59 to col. 10, line 17. The Examiner particularly pointed out to Table 1, col. 24, the PSD (particle size distribution) of *Denton et al.* See page 6, Response to Arguments in the Final Office Action. Appellants wish to draw to the Honorable Board's attention the fact that the PSD data in *Denton et al.* refers to the PSD of "Dry Milling."

In view of these two essential differences between the claimed invention and *Denton et al.*, Appellants believe that the cited reference cannot anticipate any of claims 1-19 according to *MPEP § 2131.*

C. Conclusion

In view of the above arguments, Appellants respectfully request that the Honorable Board of Appeals reverse the Examiner's above anticipation rejection and allow Appellants' claims 1-19.

Respectfully submitted,
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Enclosures: Appendices VIII-X

VIII. CLAIMS APPENDIX

1. A process for preparing a support for catalysts, which comprises:

a) preparing a hydrogel;

b) milling the hydrogel to give a finely particulate hydrogel having a solids content;

c) producing a slurry having a solids content, the slurry comprising the finely particulate hydrogel;

d) drying the slurry comprising the finely particulate hydrogel, thereby forming a support for catalysts,

wherein the finely particulate hydrogel comprises:

- at least 5% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 3 µm; and
- at least 40% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 12 µm, and
- at least 75% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 35 µm.

2. The process for preparing the support for catalysts as claimed in claim 1, wherein the finely particulate hydrogel comprising at least 90% by volume of the hydrogel particles, based on the total volume of the particles, has a particle size in the range from > 0 µm to ≤ 35 µm.

3. The process for preparing the support for catalysts as claimed in claim 1, wherein the finely particulate hydrogel has a solids content in the range from > 0% by weight to ≤ 25% by weight, calculated as oxide.

4. The process for preparing the support for catalysts as claimed in claim 1, wherein the finely particulate hydrogel, comprising at least 40% by volume of the hydrogel particles, based on the total volume of the particles, has a particle size in the range from > 0 µm to ≤ 10 µm.

5. The process for preparing the support for catalysts as claimed in claim 1, wherein the finely particulate hydrogel comprising at least 10% by volume of the hydrogel particles, based on the total volume of the particles, has a particle size in the range from > 0 µm to ≤ 2.8 µm.

6. The process for preparing the support for catalysts as claimed in claim 1, wherein inorganic hydroxides, oxide-hydroxides, oxides and/or salts, or mixtures thereof, are added to the hydrogel in step b) and/or the slurry in step c).

7. The process for preparing the support for catalysts as claimed in claim 1, wherein inorganic hydroxides, oxide-hydroxides, oxides and/or salts are added to the hydrogel in step b) and/or the slurry in step c) in an amount of ≤ 10% by weight based on the total solids content.

8. The process for preparing the support for catalysts as claimed in claim 1, wherein AlOOH is added to the hydrogel in step b) and/or the slurry in step c) in an amount of from 1% by weight to 30% by weight, based on the total solids content.

9. The process for preparing a support for catalysts as claimed in claim 1, wherein compounds of alkaline earth metals are added to the hydrogel in step b) and/or the slurry in step c) in an amount of from 1% by weight to 10% by weight, based on the total solids content.

10. The process for preparing the support for catalysts as claimed in claim 1, wherein hydroxyl methyl cellulose is added to the hydrogel in step b) and/or the slurry in step c) in an amount of from 0.1% by weight to 10% by weight, based on the total solids content.

11. The process for preparing the support for catalysts as claimed in claim 1, wherein the solids content of the slurry in step (c) is ≤ 20% by weight based on the total weight, in step c).

12. The process for preparing the support for catalysts as claimed in claim 1, wherein drying of the slurry comprising the finely particulate hydrogel is carried out by means of spray drying.

13. The process for preparing the support for catalysts as claimed in claim 1, wherein ≤ 5% by volume of the support obtained after drying have a particle size in the range from > 0 µm to ≤ 25 µm, based on the total volume of the particles.

14. The process for preparing the support for catalysts as claimed in claim 1, wherein the support particles produced after drying have a mean particle size in the range from 1 µm to 350 µm.

15. A support for catalysts prepared by a process comprising:

a) preparing a hydrogel;

b) milling the hydrogel to give a finely particulate hydrogel;

c) producing a slurry comprising the finely particulate hydrogel;

d) drying the slurry comprising the finely particulate hydrogel, thereby forming a support for catalysts,

wherein the finely particulate hydrogel comprises:

- at least 5% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 3 µm; and
- at least 40% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 12 µm, and
- at least 75% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 35 µm.

16. The support for catalysts as claimed in claim 15 further comprising a silicon content of the support of ≥ 10% by weight based on the total weight of the support.

17. The support for catalysts as claimed in claim 15 further comprising an aluminum content of the support of ≥ 10% by weight, based on the total weight of the support.

18. A process comprising:

a) preparing a hydrogel;

b) milling the hydrogel to give a finely particulate hydrogel;

c) producing a slurry comprising the finely particulate hydrogel;

d) drying the slurry comprising the finely particulate hydrogel, thereby forming a support for catalysts; and

e) supporting a catalyst on the support,

wherein the finely particulate hydrogel comprises:

- at least 5% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 3 µm; and
- at least 40% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 12 µm, and
- at least 75% by volume of the particles, based on the total volume of the particles, have a particle size in the range from > 0 µm to ≤ 35 µm.

19. The process of claim 18 wherein the catalyst is a polymerization or copolymerization catalyst for olefins.

Claims 20-42 canceled.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None